REMARKS

In the Office Action, the Examiner rejected claims 1, 5, 10, 12, and 13 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement; rejected claims 14 and 15 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement; rejected claims 1-3, 6, 7, and 10-13 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,654,374 to Fawaz et al. ("Fawaz") in view of U.S. Patent Application Publication No. 2002/0075875 to Dravida et al. ("Dravida") and further in view of U.S. Patent Application Publication No. 2002/0012348 to Mizuhara ("Mizuhara"); and rejected claims 4, 5, 14, and 15 under 35 U.S.C. § 103(a) as unpatentable over Fawaz in view of Dravida and Mizuhara and further in view of U.S. Patent No. 6,047,000 to Tsang et al. ("Tsang").[1] Applicants respectfully traverse the Examiner's rejections under § § 112 and 103.

Regarding claim rejections under § 112

Applicants respectfully traverse the Examiner's rejection of claims 1, 5, 10, 12, and 13 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. To comply with the written description requirement under 35 U.S.C. § 112, first paragraph, each claim limitation can be supported by the originally filed disclosure expressly, implicitly, or inherently. See M.P.E.P. § 2163.05.

The Examiner alleges that "[t]he limitation '*allocating a predetermined amount of bandwidth*' as described in the claims has no support in the disclosure." (Office Action

[1] The Office Action contains a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicants decline to automatically subscribe to any statement or characterization in the Office Action.

at 2.) Applicants respectfully disagree and submit that this limitation is sufficiently supported by the originally filed disclosure.

For example, the originally filed specification discloses that "[s]erver sub-module 118 in conjunction with service list 120 may use a quantum and a deficit counter for each flow of packets to determine how a particular priority queue is serviced. The quantum represents a share of available bandwidth (e.g., in bytes) allocated to a flow within the period of one round." Specification, para. [032], emphasis added. "A quantum$_i$ for a flow i can be expressed as $Quantum_i = \frac{r_i}{C} \times F$, . . . where r_i is the rate allocated to flow i, C is the link service rate, ..." Specification, paras. [032]-[034].

Therefore, the original specification clearly discloses that server sub-module 118 allocates a pre-calculated share of available bandwidth to an identified flow, which directly corresponds to the claim limitation "allocating a predetermined amount of bandwidth to said identified flow," as recited in claim 1, 10, 12, and 13. Accordingly, Applicants request withdrawal of the Section 112 rejection of claims 1, 10, 12, and 13 and of claim 5, which depends from claim 1.

Applicants also respectfully traverse the Examiner's rejection of claims 14 and 15 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement, because the limitations of claims 14 and 15 are sufficiently supported by the original filed disclosure.

The Examiner alleges that "[t]he limitation '*allocating a second predetermined amount of bandwidth*' and '*recalculating the accumulated bandwidth*' as described in the claims has no support in the disclosure." (Office Action at 3.) Applicants respectfully disagree.

For example, the original specification discloses that "[a] flow accumulates shares of bandwidth (i.e., in quantum increments) during a round. The deficit counter accumulates any residual quantum of flow i in the (j-1)th round, which can be represented as $DeficitCounter_i^{j-1}$. The next time that flow i is serviced by a node, an additional $DeficitCounter_i^{j-1}$ bytes of data (i.e., incremented by $quantum_i$) can be sent out in the jth round." Specification, para. [035], emphasis added.

Thus, the specification again clearly discloses that server sub-module 118 allocates an additional or second pre-calculated share of bandwidth, which directly corresponds to the claim limitation "allocating a second predetermined amount of bandwidth," as recited in claim 14.

As a further example, the originally filed specification discloses that "[i]n one embodiment, server sub-module 118 updates the deficit counters ($DeficitCounter_i^j$) in service list 120 according to the equation:

$DeficitCounter_i^j = DeficitCounter_i^{j-1} + Quantum_i$." Specification, paras. [037]-[038], emphasis added. Thus, the specification again clearly discloses that server sub-module 118 updates or recalculates the deficit counter (accumulated shares of bandwidth), which directly corresponds to the claim limitation "recalculating said accumulated bandwidth," as recited in claim 14. Accordingly, Applicants request withdrawal of the Section 112 rejection of claim 14 and its dependent claim 15.

Regarding claim rejections under § 103

Applicants respectfully traverse the Examiner's rejection of claims 1-3, 6, 7, and 10-13 under 35 U.S.C. § 103(a) as unpatentable over Fawaz in view of Dravida and Mizuhara, because a *prima facie* case of obviousness has not been established.[2]

In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim elements. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify a reference or to combine reference teachings. Third, there must be a reasonable expectation of success. See M.P.E.P. § 2143.

Independent claim 1 is directed to a method for scheduling a packet, comprising a combination including, for example, "allocating a predetermined amount of bandwidth to said identified flow; determining an accumulated bandwidth based on said predetermined amount of bandwidth; and processing said packet in the one of the plurality of queues based on said accumulated bandwidth and said size of said packet." Fawaz fails to teach or suggest at least the above claim elements as recited in claim 1.

Fawaz discloses a method and apparatus for interconnection of packet switches with guaranteed bandwidth. "Upon arrival at a QoS Node 102, 106, packets (e.g., ethernet frames) are placed into an input buffer 302. Subsequently, classifier 304 classifies each packet in accordance with an SLA. . . . [O]nce an SLA has been identified for the packet using the various classification information, the packet is placed

[2] Applicants respectfully point out that the Examiner did not address the new claim limitations added to claims 1, 10, 12, and 13 and presented in the Amendment filed June 2, 2006, in the current Section 103 rejections. Applicants request that the Examiner address this discrepancy in the next Office Action.

into a FIFO-type buffer 306-312 that corresponds to the SLA, forming a queue of packets for the SLA." Fawaz, column 7, lines 29-54. "In addition, each QoS Node in some embodiments of the invention, can also implement an internal flow control. When the occupancy of an output buffer 317 (FIG. 6) exceeds a high threshold, the scheduler 316 marks the SLA's that should be sent to that buffer as congested and skips those queues." Fawaz, column 12, lines 18-23, emphasis added.

However, Fawaz's teaching of using occupancy of the output buffer as the mark for congestion focuses on how fast the buffer can be emptied, i.e., the speed and rate of the transmission. Such teaching does not constitute "determining an accumulated bandwidth based on said predetermined amount of bandwidth; and processing said packet in the one of the plurality of queues based on said accumulated bandwidth and said size of said packet," as recited in amended claim 1 (emphasis added).

Dravida fails to cure Fawaz's deficiencies. Dravida discloses a broadband system with transmission scheduling and flow control. "Packet handling at a network element includes receiving packets on input links coupled to the network element, each packet having a quality of service (QoS) class indicating a service priority ranging from highest (1) to lowest (N). Received packets for each of the QoS classes from 1 to N-1 are stored in a common queue per QoS class while packets received for the lowest (N) QoS class are stored in link queues corresponding to the input links. The packets are transmitted from the common queues and the plural link queues to an output link according to a scheduling discipline." Dravida, abstract, emphasis added.

However, Dravida fails to teach or suggest at least "processing said packet in the one of the plurality of queues based on said accumulated bandwidth of the flow and

said size of said packet," as recited in amended claim 1 (emphasis added). In fact, Dravida's teaching of using a common queue teaches away from "processing said packet in the one of the plurality of queues based on said accumulated bandwidth and said size of said packet," as recited in amended claim 1 (emphasis added).

Further, Mizuhara fails to cure the deficiencies of Fawaz and Dravida. Mizuhara discloses "a router device capable of using separated queues with arbitrary fineness and flexibly achieving assurance and separation of traffic." Mizuhara, abstract. In Mizuhara, "[o]utput side bandwidth controller 8 performs scheduling with fixed priority in the order of the EF, AF1 to 4, and BE classes, with the use of the WRR for the AF1 to 4 classes. Output side bandwidth controller 8 instructs output side in-device cell buffer 6 to output in-device cell e including scheduled in-device cell header e1 to in-device packet controller 4." Mizuhara, para. [90], emphasis added. However, Mizuhara's teaching of using fixed priority to schedule ATM cells does not constitute "determining an accumulated bandwidth based on said predetermined amount of bandwidth; and processing said packet in the one of the plurality of queues based on said accumulated bandwidth and said size of said packet," as recited in amended claim 1 (emphasis added).

Therefore, none of Fawaz, Dravida, and Mizuhara, taken alone or in any reasonable combination, teaches or suggests all elements of Applicants' invention as recited in amended claim 1. A *prima facie* case of obviousness has not been established. Accordingly, Applicants respectfully request withdrawal of the Section 103 rejection of claim 1. Because claims 2, 3, 6, and 7 depend from claim 1, Applicants also

request withdrawal of the Section 103 rejection of claims 2, 3, 6, and 7 for at least as being dependent from an allowable base claim.

Further, amended independent claims 10, 12, and 13, while of different scope, recite similar language to that of claim 1. Claims 10, 12, and 13 are therefore also allowable for at least the same reasons stated above. Applicants respectfully request withdrawal of the Section 103 rejection of claims 10, 12, and 13. Because claim 11 depends from claim 10, Applicants also request withdrawal of the Section 103 rejection of claim 11 at least as being dependent from an allowable base claim.

Applicants respectfully traverse the Examiner's rejection of claims 4, 5, 14, and 15 under 35 U.S.C. § 103(a) as unpatentable over Fawaz in view of Dravida, Mizuhara, and further in view of Tsang.[3] Claims 4, 5, 14, and 15 depend from claim 1, either directly or indirectly.

As stated above, Fawaz, Dravida, and Mizuhara fail to teach or suggest at least "allocating a predetermined amount of bandwidth to said identified flow; determining an accumulated bandwidth based on said predetermined amount of bandwidth; and processing said packet in the one of the plurality of queues based on said accumulated bandwidth and said size of said packet," as recited in amended claim 1 and required by claims 4, 5, 14, and 15 that depend therefrom. Tsang fails to cure the deficiencies of Fawaz, Dravida's, and Mizuhara.

Tsang discloses a packet scheduling system "where the data packets are variable in size and wherein each input stream is allocated a share of the bandwidth of

[3] Applicants respectfully point out that the Examiner apparently also did not address the previously added new claims 14 and 15 presented in the Amendment filed June 2, 2006, in the Section 103 rejections. "In so far as understood, with respect to claims 4-5 and 8, 9, . . ." (Office Action at 7.) Applicants request that the Examiner address this discrepancy in the next Office Action.

the output transmission link, the selecting means comprises means for determining the credit allocated to each input stream, the bandwidth allocated to each input stream, and the size of the head of line packets waiting to be transmitted in each input stream, and means for sorting the head-of-line packets in accordance with the difference between the size of the head of line packets and the allocated credit as a proportion of the allocated bandwidth, whereby the input stream having an allocated credit closest to the packet size as a proportion of allocated bandwidth is selected for transmission. Following transmission of a packet the credit for the transmitted input stream is reset to zero." Tsang, column 2, lines 27-39, emphasis added.

However, Tsang's teaching of using closest allocated bandwidth does not constitute "determining an accumulated bandwidth based on said predetermined amount of bandwidth; and processing said packet in the one of the plurality of queues based on said accumulated bandwidth and said size of said packet," as recited in amended claim 1 (emphasis added). In fact, Tsang, by explicitly teaching that the credit is reset to zero after transmission, teaches away from "processing said packet in the one of the plurality of queues based on said accumulated bandwidth and said size of said packet," as recited in amended claim 1 (emphasis added).

Therefore, none of Fawaz, Dravida, Mizuhara, and Tsang, taken alone or in any reasonable combination, teaches or suggests all elements of Applicants' invention as recited in amended claim 1 and required by claims 4, 5, 14, and 15. Accordingly, claims 4, 5, 14, and 15 are allowable over Fawaz in view of Dravida, Mizuhara, and Tsang. Applicants therefore request withdrawal of the Section 103 rejection of claims 4, 5, 14, and 15.

Conclusion

In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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